



# Species

## Threatened fishes of the world: *Garra kalakadensis* Remadevi, 1992, (Cyprinidae: Cypriniformes)

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### Keywords

*Garra kalakadensis* – Endangered species, Western Ghats, South India.

### Common name

English – Kalakad Stone Carp, Kalakad *Garra*

## 1. INTRODUCTION

*Garra kalakadensis* described by Rema Devi (1993) from Pachaiyar, east of Sengaltheri, Kalakad Wildlife Sanctuary, Tirunelveli District, Tamil Nadu, India. The holotype and paratypes kept in the Zoological Survey of India, Southern Regional Station, Chennai are almost in dried condition and the measurements and counts are almost not possible and hence topotypes from the same locality were collected and presented.

## 2. CONSERVATION STATUS

*Garra kalakadensis* is listed as Endangered because its extent of occurrence is less than 5,000 km<sup>2</sup>, its area of occupancy is less than 500 km<sup>2</sup>, and it is known only from two locations (IUCN, 2013).

Muthukumarasamy Arunachalam et al.

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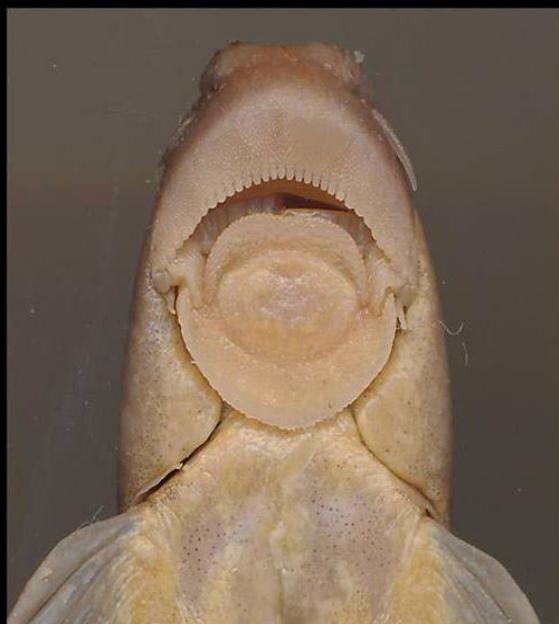
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**Fig. 1a - Horizontal view of *Garra kalakadensis* collected from Karumandiamman kovil, Sengaltheri, Pachaiyar River, Tamiraparani River basin, Tamil Nadu.**

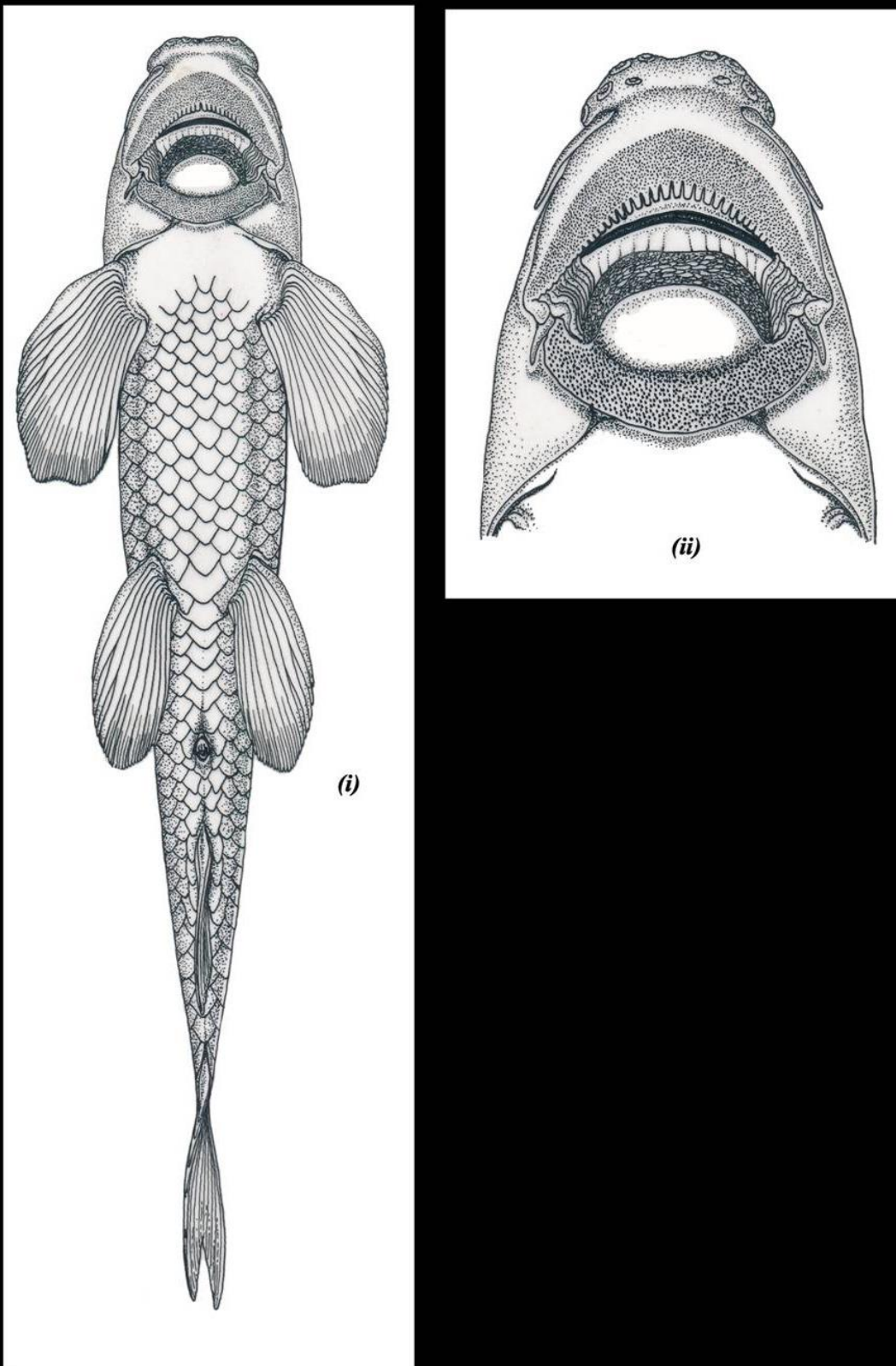


**Fig. 1b - Ventral view of *Garra kalakadensis***



**Fig. 1c - Mouth of *Garra kalakadensis* in caudoventral aspect to show papillose upperlip.**

**Fig. 2 - Line drawings of ventral (i) and Mouth (ii) views of *Garra kalakadensis* collected from Karumandiamman kovil, Sengaltheri, Pachaiyar River, Tamiraparani River basin, Tamil Nadu.**



### 3. TAXONOMIC DESCRIPTION

Counts and measurements are from 10 specimens ranging from 54.4 – 71.0 mm standard length. Body characters are represented in times by standard length (SL) and head characters are represented in head length (HL). Body depth is 3.9 to 4.9 times in SL. Head length is 3.5 to 3.7 times in SL; width of head is 1.2 to 1.4 times in HL. Head depth at nostril is 2.2 to 2.7 times; head depth at pupil is 1.7 to 2.1 times; head depth at occiput is 1.5 to 1.8 times. Orbit width is 3.9 to 4.9 times. Inter-orbital convex; its width is 2.2 to 2.8 times. Pupil of eye is located at or slightly behind the middle of the length of head. Nasals are well developed. In some large and mature specimens, a distinct lateral tubercular area is seen almost projecting from the snout as lateral horns (Figures 1 and 2).

Snout is rounded; its length is 1.8 to 2.1 times. Mouth is arched; Barbels two pairs, rostral barbel length is 14.9 – 18.6 ( $16.5 \pm 1.1$ ) shorter than eye-diameter, posterior maxillary barbel length is 3.9 – 11.1 ( $5.9 \pm 2.1$ ). Dorsal-fin is inserted nearer snout tip than to caudal-fin base; pre dorsal length is 2.0 to 2.2 times; post dorsal length is 1.9 to 2.2 times (Table. 1).

Dorsal-fin upper edge concave and is moderately high 4.1 to 4.4 times. Pre pelvic-fin distance is 1.8 to 2.0 times. Pectoral-fin is longer than head length; its length is 3.8 to 4.1 times; pelvic-fin length is 4.6 to 5.0 times.

Distance between pectoral-fin to vent is 1.9 to 2.2 times; distance between pelvic-fin to vent is 4.6 to 6.1 times; distance between pectoral-fin insertion to pelvic-fin insertion is 3.2 to 3.9 times; distance between pectoral-fin insertion to anal-fin origin is 2.1 to 2.2 times; distance between pelvic-fin insertion to anal-fin origin is 5.0 to 6.5 times.

Caudal-fin is deeply forked, longer than head; its length is 3.2 to 3.8 times; lobes are pointed and equal. But in some times, majority of the specimens the lower lobe is longer.

Mental disc is well-developed; disc length is 2.4 to 2.9 times; disc width is 1.6 to 2.0 times; central-pad length is 3.7 to 5.3 times; central-pad width is 2.6 to 3.2 times.

Fins are long and the counts are: dorsal-fin, ii – 8 (10); anal-fin, ii - 5 (10); pelvic-fin, i – 8 (10) and pectoral-fin, i - 13 (4), 14 (5), 15 (1) Scales are moderate-size; lateral-line scales, 32 (7), 33 (3); pre dorsal scales, 10 (8), 11 (2); upper transverse scales, 4.5 (10); scale rows from lateral-line to pelvic-fin insertion, 2.5 (10); lower transverse rows, 3.5 (10); circumpeduncular scales, 12 (3), 13 (2), 14 (5); circumferential scales, 19 (6), 20 (4); scales between vent and anal-fin, 2 (5), 2.5 (2), 3 (2), 3.5 (1); breast and belly scaled, but scales on breast are much reduced; pre anus scales, 17-20 (Table 2).

As per original description (Remadevi, 1993), body colouration dark, sometimes lighter with a prominent lateral band extending to the middle rays of the caudal-fin; the first scale on the upper opercular margin very dark. Dorsal-fin edge is concave, in some the rays are darkened, and in some paler specimens, a faint band across the middle of the paired and vertical-fins are seen.

### 4. GEOGRAPHICAL DISTRIBUTION

India: Kalakad Wildlife Sanctuary, South eastern part of Western Ghats and only known from two localities.

### 5. MATERIALS EXAMINED

MSUMNH-C5 10 ex., 54.37–70.98 mm SL, Karumandiamman kovil, Sengaltheri, Pachaiyar River, Tamiraparani River basin, Tamil Nadu. Collected by Dr. M. Arunachalam and team, 06 Oct. 2007.

### 6. HABITAT AND ECOLOGY

It occurs in high altitudes streams (1000 m) with bedrock and big boulders. It also prefers high velocity area. Since it is an endangered one, not many specimens were collected for food and feeding and breeding purposes. However, we could find fingerlings during November which reveals that the breeding season might be after north east monsoon (September and October).

**Table 1**

The minimum, maximum, mean and standard deviation of morphometric measurements of *Garra kalakadensis* collected near Karumandiamman kovil, Sengaltheri, Pachaiyar River, Tamiraparani River basin, Tamil Nadu

No.	Morphometric measurement	Min	Max	Mean	SD
1	Standard length	54.4	71.0	64.0	6.1
2	Snout to urocentrum	91.9	93.9	92.9	0.6
3	Pre anal length	72.3	76.9	74.3	1.4
4	Pre dorsal length	45.1	48.2	46.8	1.1
5	Pre pelvic length	48.9	52.8	50.2	1.1
6	Pre pectoral length	21.0	23.0	22.4	0.7
7	Pre occipital length	79.7	89.7	85.8	3.0
8	Snout to opercle	87.2	95.2	91.7	2.7
9	Upper jaw length	35.7	45.5	40.4	2.5
10	Snout length	46.3	53.6	49.9	2.7
11	Pre nasal length	33.4	40.4	37.3	2.4
12	Orbit width	20.4	25.2	22.6	1.6
13	Inter orbital width	35.5	43.6	38.6	2.4
14	Inter nasal width	24.6	38.7	28.6	3.9
15	Head width	68.2	80.4	72.6	3.9
16	Peduncle length	10.3	13.6	12.1	1.2
17	Dorsal origin to pelvic insertion	17.3	22.2	20.2	1.4
18	Anal fin height	17.8	21.2	19.6	1.0
19	Head depth at nostril	36.4	43.7	39.8	2.5
20	Head depth at pupil	46.8	56.1	49.7	2.5
21	Head depth at occiput	53.9	66.5	59.3	3.8
22	Peduncle depth	9.5	11.3	10.5	0.5
23	Caudal fin length	26.2	31.1	28.1	1.5
24	Dorsal fin height	22.7	24.6	23.5	0.7
25	Pectoral fin length	24.2	26.2	24.8	0.6
26	Pelvic fin length	20.0	21.7	20.6	0.6
27	Maxillary barbel length	3.9	11.1	5.9	2.1
28	Rostral barbel length	14.9	18.6	16.5	1.1
29	Occiput to dorsal-fin origin	22.7	26.6	24.6	1.3
30	Occiput to pectoral insertion	15.0	17.2	16.5	0.7
31	Occiput to pelvic insertion	34.6	41.1	37.9	1.6
32	Dorsal insertion to pelvic insertion	12.8	15.9	14.7	1.3
33	Dorsal origin to pectoral insertion	20.6	24.8	23.7	1.2
34	Dorsal origin to anal origin	31.8	36.5	34.4	1.5
35	Dorsal insertion to caudal base	32.2	38.2	35.4	2.2
36	Dorsal insertion to anal origin	20.2	22.6	21.5	0.8
37	Dorsal insertion to anal insertion	24.5	28.5	26.3	1.2
38	Dorsal fin base length	12.3	18.1	14.6	1.5
39	Anal fin base length	5.6	9.3	7.6	1.2
40	Pectoral insert / pelvic insert	25.4	30.7	27.3	1.8
41	Pectoral insert \ anal origin	43.9	47.3	45.5	1.2
42	Pelvic insert to anal origin	15.3	19.6	17.9	1.1
43	Head length	14.6	19.7	17.0	1.7
44	Total length	67.3	86.7	78.4	7.2
45	Post-dorsal length	45.5	51.6	49.3	2.1
46	Body depth	16.2	19.5	18.1	1.0
47	Distance b/w pectoral fin to vent	45.3	51.2	47.8	2.0
48	Distance b/w pelvic fin to vent	16.4	21.4	19.0	1.4
49	Disc length	33.5	41.1	38.1	2.1
50	Disc width	49.4	59.5	54.1	3.1
51	Central pad length	18.6	26.6	22.8	2.6
52	Central pad width	30.5	37.4	34.1	2.0

**Table 2**

The minimum and maximum of meristic counts of *Garra kalakadensis* collected near Karumandiamman kovil, Sengaltheri, Pachaiyar River, Tamiraparani River basin, Tamil Nadu

No.	Meristic counts	Min	Max
1	Unbranched dorsal fin rays	2	2
2	Branched dorsal fin rays	8	8
3	Unbranched anal fin rays	2	2
4	Branched anal fin rays	5	5
5	Unbranched pelvic fin rays	1	1
6	Branched pelvic fin rays	8	8
7	Unbranched pectoral fin rays	1	1
8	Branched pectoral fin rays	13	15
9	Caudal fin upper lobe to Procurrent rays	9	9
10	Caudal fin lower lobe to Procurrent rays	8	8
11	Lateral line scales	32	33
12	Pre dorsal scales	10	11
13	Upper transverse rows	4.5	4.5
14	Lateral line to pelvic scale rows	2.5	2.5
15	Lower transverse rows (anus)	3.5	3.5
16	Circumpeduncular scales	12	14
17	Circumferential scales	20	20
18	Transverse breast rows	6	8
19	Anal scale rows	2	3.5
20	Pre anus scales	17	20

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